DRAFT 8/24/95

PROJECT TITLE: He'eia Ahupua'a National Estuarine Research Reserve

The Friends of He'eia State Park are a 501(c)(3) non-profit educational institution offering interpretive programs in the sciences and Hawaiian culture. He'eia State Park borders Kane'ohe Bay, He'eia Fishpond and He'eia Wetlands. The Friends are under a long term lease agreement with the Division of State Parks to provide interpretive and educational programs.

PROJECT DESCRIPTION

Conceptual Plan for Restoration of He'eia Ahupua'a

The Friends of He'eia plan to restore the historical ecosystem of the coastal community, fishpond, wetlands and stream banks of He'eia to serve as a scientific/cultural learning center for school children and the entire community. The approach to restoration must be holistic to be successful. All components are equally critical to the health of the land and sea and their sustainability.

Food and fiber crops will be grown in the middle lands and native strand vegetation will be reintroduced to the coastal area. An improved wetland comprised of native species will support a diversity of fauna and insects. Planting the riparian zone in native vegetation will benefit native stream fauna. An extensive trail system will provide access to hikers, students, researchers and the community enabling them to rediscover the natural environment and help with its rehabilitation and management.

Two major benefits will be derived from this restoration: first, intensive planting of native flora will prevent invading alien species from proliferating and second, our community will be provided an opportunity to actively participate in the resource management in the place they live.

- Provide an improved habitat for endangered and threatened native species.

- Monitor water quality along the He'eia Stream, in the wetlands and at designated spots along the coastal waters

POLLUTION PREVENTION & PROTECTION OF COASTAL WATERS, GROUNDWATER AND WETLANDS

Pollution Prevention Aspect

Nonpoint sources are the major cause of degradation of coastal waters in the State. In order to meet water quality standards and the new requirements of the Coastal Zone Act Reauthorization Amendments (CZARA), innovative measures need to be undertaken. The major NPS entering this portion of Kane'ohe Bay are sediments and nutrients. The Kane'ohe Bay Task Force recognized preservation and expansion of all Kane'ohe Bay wetlands as an effective and inexpensive measure to limit sediment entry into marine waters.

The U.S. Corps of Engineers assessed water quality in He'eia in 1993 (see References). Their report presents the first analytical study of the wetland sediments and water quality of the He'eia wetland, fishpond, and two nearshore areas of Kane'ohe Bay. The report provides baseline conditions and potential for sediment transport, PCB and other contaminant accumulation, and general water quality conditions.

The report notes that water quality in He'eia Stream is relatively pristine through much of its length and that NPS are the primary contributor to degradation of water quality as it moves downstream. The impact of He'eia watershed, and further development within it, is related to the amount of water entering the Bay, peak flows during rainfall events, and the quality of the water.

The water quality analysis contained in the Corps report provides valuable baseline information for monitoring the proposed project.

Current Condition of Site

As noted earlier, He'eia marsh has been degraded and needs restoration. There was also a problem with the fishpond. The fishpond was damaged by heavy flooding in the late sixties and again during heavy rains in February, 1994. He'eia Stream was not following its natural course to the bay; instead it is flowing directly into a permanent pool that spills over into the fishpond during heavy rains. As a consequence, the fishpond, which is privately operated, was receiving most of the direct discharge of He'eia Stream and its associated sediments. Erosion around Ke Alohi Point continues. Ten feet of soil around the stream mouth have eroded within the past ten years.

The fishpond operator wished to control this input and rebuild a section of the fishpond wall. The State DLNR removed 1500 feet of mangrove forest and associated sediment on the seaward side of Kamehameha Highway to reconstruct the original stream course.

Kane'ohe Bay is particularly sensitive to sediment because of its coral reefs. If the He'eia Stream is realigned at its mouth to discharge directly into the Bay instead of going through the fishpond, where much of the sediment is trapped, the Bay may be further impacted.

In December 1994, DLNR contracted a crew to remove the mangrove and restore the stream flow. The reef flats do not appear to be severely impacted as a result of the stream clearing, as the stream flow remains minimal. No plumes or sediment are noticeable.

Resource Management Plans

He'eia Marsh and Kane'ohe Bay generally have been the subject of numerous studies, reports and plans. The most recent is the Kane'ohe Bay Task Force Master Plan, published in May 1992. The Master Plan supports the ahupua'a or total watershed approach to water quality management advocated by the Friends of He'eia. In its section on nonpoint source pollution, the Master Plan recommends preservation and expansion of wetlands as an effective and inexpensive measure to limit sediment entry into marine waters.

The *State Land Use District Boundary Review for Oahu* prepared by the Office of State Planning, recommends that He'eia Marsh be reclassified from Urban to Conservation.

PUBLIC EDUCATION AND INFORMATION ACTIVITIES

The location of He'eia State Park as a wooded, coastal peninsula on a coral reef and next to an ancient Hawaiian fishpond and wetland provides the Friends with a natural laboratory. This is an ideal setting for applied science education and interpretive studies.

The Friends have been servicing over 11,000 school children annually with comprehensive programs in ethnobotany and marine biology with a focus on Hawaiian culture since 1988.

This project will be used as a prototype for future ahupua'a restoration projects. A trail system will allow members of the community to access the area in a manner so as not to destroy its sensitive environment. The Friends will create a series of community work days in which organized groups and individuals may participate in the area improvement and planting. Through this type of participation, volunteers will be available to help with the water quality monitoring.

One goal of the public education program will be to emphasize the importance of these native plants as filtering systems. Indigenous communities are low maintenance and are capable of maintaining themselves without growing out of control like many introduced species.

A series of classes and lectures will be offered to the community in coordination with the local community college to explain the system of hydrology in the ahupua'a watershed. Windward Oahu has a complex dike system in the Koolau mountains and eleven perennial streams that enter Kaneohe Bay.

Since the ahupua'a also has zones of elevation, classes in botany will address these levels and explain the conditions needed by different plants to live. Marine biology classes will explore the bay as an estuary and study the relationship between the health of the coral reefs and the bay and the land use of the adjacent area.

Social and Cultural Benefits

The social and cultural benefits of restoring the He'eia wetlands are great. The Friends of He'eia State Park offer interpretive programs in the sciences and Hawaiian culture. The park is located in the ahupua'a of He'eia, an ancient Hawaiian land division, that extends from the Ko'olau Mountains to the barrier reef of Kane'ohe Bay. The Friends take advantage of this location by using the ahupua'a system as a model of sensible land and water management.

We are already undertaking a program to restore native vegetation in the coastal strand area. Expanding this program to include the wetlands would greatly increase the value of the resource in the Friends' educational programs in marine biology and ethnobotany. In 1993, there were over 11,000 visitors to the park. Since the Friends began their programs, over 100,000 Windward elementary public and private school students have participated in field trips and classes to learn about the environment and Hawaiian culture. These numbers are expected to increase.

The potential is great for the park to serve as an educational resource center for key decision makers in the community.

COOPERATING AGENCIES

Contact Person: Carl Evensen
Agency/Organization: University of Hawaii, Department of Agronomy, Phone 926-8825
Working on watershed management approaches to soil stability

Contact Person: Margo Stahl
Agency/Organization: U.S. Fish & Wildlife Service
Phone/Fax 541-2749/ 541-2756
Stream mapping; water quality sampling; flora and fauna reestablishment in riparian zones and stream fauna

Contact Person: Randy Harr
Agency/Organization: Division of Aquatic Resources, Department of Land and Natural Resource Phone/Fax 587-0211/ 587-0115
Will assist with the educational component of the wetlands, streams system and near shore coastal resources

U.S. Army Corps of Engineers. September 1993. *An Assessment of the Water Quality and Wildlife Impacts in the He'eia Watershed from Construction of the U.S. Coast Guard Proposed Housing Project at the Omega Station Haiku Valley.*

U.S. Environmental Protection Agency. 1993. *Created and Natural Wetlands for Controlling Nonpoint Sources of Pollution.*

U.S. Environmental Protection Agency. January 1993. *Guidance Specifying Management Measures for Sources of Pollution in Coastal Waters.*